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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,943	07/05/2006	Yasushi Noguchi	128634	2767

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EXAMINER	
ROYSTON, ELIZABETH	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
05/28/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/584,943	NOGUCHI ET AL.	
	Examiner	Art Unit	
	Elizabeth Royston	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/12/2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,17,18,20,22,24,26,28 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12, 17, 18, 20, 22, 24, 26, 28, and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12, 17, 18, 20, 22, 24, 26, 28, and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 is indefinite as it is unclear if the storage temperature of 40ºC is included as part of the claimed process step of storing a foamed resin for four weeks. For purposes of examination, it is assumed that the storage step includes the temperature recited in the claim limitation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 12, 17, 20, 22, 24, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US PGPUB 2003/0143370) in view of Kitano (US PN 5861214), as evidenced by the MATSUMOTO MICROSPHERE F-series product data.

With regard to claims 12, 17, 20, and 28, Noguchi teaches a method of manufacturing a porous ceramic structure which comprises mixing together a ceramic material (paragraph 43, line 3; paragraph 44, line 3), a foamed resin (paragraph 57, line 4), and a forming auxiliary (paragraph 61, line 1-4), forming the mixture into a body (paragraph 63, line 1-4), and then firing the body (paragraph 65, line 1-6).

Noguchi does not explicitly disclose specific details about the foamed resin.

Kitano teaches a foamed resin with 60 wt% or more of acrylonitrile and 20 wt% or less of methyl methacrylate and with 15 wt% of a C5 gas (col. 6, Example 4). Kitano further teaches a diameter of 2 to 200 μm (col. 3, line 53-58; col. 6, Example 4, line 46).

Although Kitano does not explicitly disclose storing the resin for four weeks, Kitano does teach that the effectiveness of the expanding resin of the invention is not lost after four weeks (col. 3, line 64-67). It would have been obvious to one of ordinary skill in the art at the time of the invention that if the resin is stable for four weeks, to store the resin for up to four weeks. Furthermore, since the composition of the outer shell is within the ranges claimed by Applicant, and since the gas amount is in the range as claimed by Applicant, the weight decrease of the gas must also have been within the ranges claimed by Applicant.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the resin composition in the teaching of Kitano as the resin composition in the teaching of Noguchi. The motivation to do so would have been the rationale provided by the teaching of Kitano, that to use such a resin composition predictably results in a foamed resin with high chemical and heat resistance (col. 1, line 28-29; col. 2, line 41-42).

Although Noguchi in view of Kitano does not explicitly disclose a storage temperature of 40°C, storage temperatures of up to 40°C were known for foamed resins, as evidenced by the MATSUMOTO MICROSPHERE F-series product data.

With regard to claims 22 and 24, Noguchi teaches a honeycomb filter with a plurality of through-holes opened in an exhaust gas inflow-side end face and an exhaust gas outflow-side end face and in which the plurality of through holes are closed alternately in opposite end face portions (paragraph 47, line 1-4).

With regard to claim 26, Noguchi teaches a method of manufacturing a ceramic structure wherein the main components include cordierite and silicon carbide (paragraph 43, line 3; paragraph 44, line 3).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US PGPUB 2003/0143370) in view of Kitano (US PN 5861214) as evidenced by the MATSUMOTO MICROSPHERE F-series product data, as applied for claims 12, 17, 20,

22, 24, 26, and 28 above, and as further evidenced by Ahmed et al. 1996 and Gehlsen (US PN 6103152).

With regard to claims 18, Noguchi in view of Kitano does not explicitly disclose 90 wt% or more of acrylonitrile. However, Kitano does teach a resin shell with a combined wt% of acrylonitrile and methacrylonitrile of 90 wt% or more (col. 6, Example 4).

Ahmed teaches that the structural similarity of methacrylonitrile to acrylonitrile allows methacrylonitrile to be used as a replacement for acrylonitrile in plastic and elastomer applications (col. 1, line 1-7). Since methacrylonitrile and acrylonitrile appear to have a known functional equivalency, it would have been obvious to one of ordinary skill in the art at the time of the invention to use 90 wt% or more acrylonitrile in the resin composition in the teaching of Noguchi in view of Kitano.

Furthermore, Gehlsen teaches that the tensile and cohesive strength of the resin is directly dependent on the acrylonitrile content in the resin shell (col. 7-8, line 61-97, 1-25), even to the point of having virtually no secondary polymeric material in high strength shells (col. 8, line 24-25) . It would have been obvious to one of ordinary skill in the art the time of the invention to optimize the acrylonitrile content in the teaching of Noguchi in view of Kitano so as to produce a shell with the desired strength.

7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US PGPUB 2003/0143370) in view of Kitano (US PN 5861214) as evidenced by the

MATSUMOTO MICROSPHERE F-series product data, as applied for claims 12, 17, 20, 22, 24, 26, and 28 above, and in further view of Nagata (US PN 6440185).

With regard to claim 30, Noguchi in view of Kitano does not explicitly disclose a shell wall thickness.

Nagata teaches that shell wall thicknesses of 0.05 to 5 μm were known in the art at the time of the invention (col. 5, line 52-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the shell wall thickness taught by Nagata as the thickness in the teaching of Noguchi in view of Kitano. The rationale to do so would have been found in the teaching of Nagata that using a foamed resin with such a wall thickness in mixtures predictably adds numerous small “pores” (col. 3, line 26-30; col. 5, line 18) to a material (col. 3, line 16-19, line 49-50), which is in line with the motivation provided by Noguchi of using a foamed resin to create a high-porosity structure (Noguchi, paragraph 58).

Response to Arguments

8. Applicant's arguments with respect to claims 12, 17, 18, 20, 22, 24, 26, 28, and 30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Royston whose telephone number is 571-270-7654. The examiner can normally be reached on M-Th 8:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ER/
Patent Examiner, GAU 1791

/Christina Johnson/
Supervisory Patent Examiner, Art Unit 1791